

ABSTRACT

The invention relates to isolated hemangioblast cells. Hematopoietic and endothelial cells are postulated to be derived from a common progenitor, hemangioblast. While hemangioblast has
5 been isolated retrospectively during embryonic stem cell differentiation, it has not been isolated from embryos or from bone marrow. Prospectively stable clonal cell lines have been isolated from mammalian embryos, from embryonic stem cells and from mammalian bone marrow that can differentiate *in vitro* into
10 tubular structures with both endothelial and hematopoietic markers such as CD34, CD31, Flk-1, TIE2, P-selectin, Sca-1, thy-1, CD45, and smooth muscle actin. Gene expression profiles in the undifferentiated and differentiated cells were consistent with endothelial and hematopoietic differentiation potential.
15 Transplantation studies in isogenic or immunodeficient mice demonstrated that these cells were not tumorigenic. In an appropriate microenvironment, the cells incorporate into the vasculature and participate in hematopoiesis.